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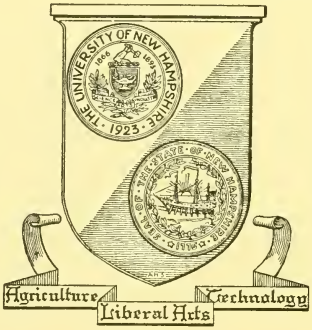

The University
of
New Hampshire

Station
Bulletin
442

June
1957

Dr. Albert F. Yeager

Report of the Director

OF THE

New Hampshire Agricultural Experiment Station

UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE

Cover Picture

Dr. Albert F. Yeager was born in Bazaar, Kansas, February 12, 1892, and was reared on a general farm. He received his Bachelor of Science degree at Kansas State College in Horticulture in 1912 and his Master's degree in Pomology in 1916 at Oregon State College.

From 1919 to 1937 he was head of the department of Horticulture at North Dakota College of Agriculture. During this period he introduced such plants as Sunshine Sweet Corn, Buttercup Squash, Bison Tomato, Pixwell Gooseberry, and Red River Crabapple.

In 1936 he obtained his Doctor's degree from Iowa State College and then taught vegetable crops at Michigan State University from 1937-1939.

From 1939 to the present time he has been Chairman of the Department of Horticulture at the University of New Hampshire. He has been Associate Director of the Biological Institute at the University, horticultural consultant for the Beechnut Company, president of the American Society of Horticultural Science, and is now a member of the American Institute of Biological Sciences, the American Society of Plant Physiologists, Phi Kappa Phi, Alpha Zeta, and Sigma Xi.

Dr. Yeager has developed and introduced over thirty varieties of vegetables and flowers—four of which have won All-American Awards. He is the author of many articles on the subject of horticulture.

Honors for his contributions to horticulture include the Stevenson Memorial Gold Medal—Manitoba, Canada; Award of Merit, Vegetable Growers' Association of America; Robertson Memorial Gold Medal, Brookings, South Dakota; and the Wilder Medal of the American Pomological Society. In 1956 he was elected to membership in the American Academy of Arts and Sciences.

Foreword

This bulletin conveys the 68th annual report of the Director of the New Hampshire Agricultural Experiment Station. Listed herein are the numbers, titles, and personnel for each of the more than 90 formal projects active during all or any part of the fiscal year ended June 30, 1956. Also included are a listing of the staff, the titles and authors of publications, a financial statement, and a description of state services.

Publications of the Station consist of bulletins, reports, reprints of scientific articles in professional journals, mimeographed commentaries, and the Progress Report. A printed list of available publications may be obtained from the Mail Clerk upon request.

Many, public, private, and industrial organizations have made generous contributions to many of our more significant research projects. We acknowledge these gifts with gratitude. Three employees of the United States Department of Agriculture are attached to the Station as cooperative agents. They contribute much to the research program.

On occasion we in New England hear about a declining agriculture—fewer people living on farms, fewer farms, and fewer acres in farms. These trends are national in scope and indicate progress, not decline. Production per farm and production per man are rising with tremendous strides. This is progress—the results of successful research. Any statement about a declining agriculture in New England must be interpreted in relation to the remainder of the country. If New England agriculture retained its status quo of 25 or 30 years ago, producing the same amount of food with the same number of people and the same number of farms, it would be declining. On the contrary, New England agriculture is progressing, as evidenced, for instance, by the production of more milk from fewer farms, with fewer cows and with fewer workers. A capital investment of $50,000 to $100,000 is not uncommon.

Colleges of agriculture today are not turning out well disciplined scientists in sufficient numbers to meet the demand. This situation creates a serious problem for administration of research with respect to recruitment of competent personnel. A century or so ago most problems concerned with the production, processing, and distribution of food were farm problems. Today, many of these functions or services have moved off the farm and consequently a large segment of our economy concerns itself with services once a part of farm production. The situation is now such that opportunities for young people are largely in industries off the farm, but allied with the production of food. The commercial farmer as a producer is really in business and as such is involved in business relationshlips with the outside world. This relatively new situation in which the farmer finds himself emphasizes the importance of expanded research on the farm unit as an efficient business, but not at the expense of research in such areas as more efficient marketing, better insecticides and fungicides, improved plants, new crops, and new uses for farm products.

Harold C. Grinnell
Director
Mathias C. Richards
Associate Director

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Active Research Projects

July 1, 1955—June 30, 1956

Administration

H-31 General Organization and Direction of Research. H. C. Grinnel, M. C. Richards.

Agricultural and Biological Chemistry

H-42 Soluble Substances in Grass and Legume Silages. T. G. Phillips, Margaret Loughlin.

H-45 A Microbiological Method for the Nutritional Evaluation of Proteins. A. E. Teeri, Margaret Loughlin.

H-46 Determination of Calcium and Magnesium in Plant Material. Warren Averill.

H-47 The Hemicellulose of Forage Crops. T. G. Phillips.

H-71 Effect of Soil Type and Mineral Additions on the Mineral Content of Clover and Timothy. G. P. Percival, Dorothy Josselyn.

H-77 Analysis of Forage Samples. G. P. Percival, Dorothy Josselyn.

H-86 Prevention of Discoloration of Pre-peeled Raw Potatoes. Warren Averill.

S-52 The Nutritive Value of Fish and Other Marine Products. A. E. Teeri, Margaret Loughlin, Dorothy Josselyn.

Agricultural Economics

H-59 A Study of the Problems of Obtaining Farming Capital. W. K. Burkett.

H-79 Marketing Mixed Grain Feed. George Rogers.

H-80 NEM-11 Costs and Efficiency in Marketing Poultry Products. W. F. Henry, W. H. Drew.

H-95 NEM-13 Alternative Markets and Prices for New Hampshire Milk Produced in Excess of Fluid Requirements with Particular Reference to the Boston Milkshed. J. R. Bowring, M. C. Purington.

H-96 NE-31 The Extent of Migration and Its Effect on Rural Communities in New Hampshire. J. R. Bowring, O. B. Durgin, M. C. Purington.

H-101 NEM-15 Opportunities for the Small Nurseryman in Developing Market Outlets. L. A. Dougherty.

S-44 Cost Reduction in Dairying. W. F. Henry.

S-50 Effects of Resevoir Construction on the Agricultural Economy of the Reservoir and Downstream Areas. W. F. Henry, W. K. Burkett.

S-58 The Structure and Competitive Position of the New England Apple Industry with Particular Reference to New Hampshire. W. H. Drew.

S-51 Evaluation of Methods of Improvement in Decision Making. O. B. Durgin.

Agricultural Engineering

S-57 Patterns of Droughts and Their Frequency in New Hampshire. R. C. Palmer.

S-65 Efficiency of Forage Harvesting. G. L. Byers.

Agronomy

H-32 The Adaptation of New Potato Varieties. P. T. Blood.

H-33 Variety Trials of Grain Crops for Forage and Grain Yields. L. J. Higgins.

H-48 Rotation, Fertility, and Cultural Experiments with Potatoes in New Hampshire. F. S. Prince.

H-50 The Influence of the Level of Available Potash in the Soil on the Longevity or Persistence of Ladino Clover in Hay Stands. R. L. Donahue.

H-51 The Improvement of Ladino Clover, Red Clover, and Timothy by Selection and Breeding. G. M. Dunn, L. J. Higgins, P. T. Blood.

H-66 The Influence of Irrigation on Pasture Production Under New Hampshire Conditions. P. T. Blood, R. S. Palmer.

H-69 The Influence of Fertilization and Stage of Cutting on the Yield, Persistency, and Protein Content of Bromegrass (Bromus inermis). R. L. Donahue, P. T. Blood.

H-83 NE-11 The Influence of Deep Tillage and Fertilizer Placement on Soil Structure and Crop Production on Soils with Compact Subsoils. S. A. Miller.

H-93 NE-11 Evaluation of Soil Physical Conditions that are Favorable to the Yield of Crops. S. A. Miller.

H-94 NE-28 The Adaption and Productivity of Regionally Developed Selections and Strains of Smooth Bromgrass as Related to Morphologic and Physiologic Characteristics. G. M. Dunn, K. H. MacKay.

H-99 NE-22 Water and Fertilizer Requirements of Selected Crops and Soils as Related to Supplemental Irrigation. A. B. Prince, R. S. Palmer, P. T. Blood.

H-105 The Improvement of White Clover. G. M. Dunn and R. A. Kilpatrick, USDA Cooperator.

S-43 A Survey of the Soils of New Hampshire. W. H. Lyford.

S-54 Soil Fertility Studies of Forage Crops. R. L. Donahue.

S-59 An Economic Evaluation of Forage Production and Utilization with Emphasis on Pastures. F. S. Prince.

Animal Husbandry

S-63 Color Discrimination in the Horse. R. R. Strang.

Bacteriology

H-49 Studies on Bovine Mastitis. L. W. Slanetz, F. E. Allen, R. T. Kumin, D. C. Hooper.

H-62 Investigations on the Microorganisms of the Bovine Rumen. W. A. Ayers.

Botany

H-34 Testing Tomato Varieties for Resistance to Late Blight Pathogen. A. E. Rich.

H-44 Propagation of Woody Plants. Stuart Dunn, C. A. Fuller.

H-57 Fungicide Investigations. A. E. Rich, R. F. Becker, J. G. Barrat, A. D. Partridge.

H-63 Virus Diseases of Strawberries in New Hampshire. A. E. Rich, R. F. Becker.

H-68 The Effects on Vegetation of Weed-control Measures Applied to Woody Plant Areas. A. R. Hodgdon, C. A. Fuller.

H-90 Light and Temperature Effects on Phytotoxity with Respect to Her-
NE-12 bicides. Stuart Dunn, S. C. Datta.

H-91 Effects of Light Quality on Plant Growth. Stuart Dunn, C. A. Fuller.

H-103 Anatomy and Morphology of the Vegetative Organs of Representative Rubus Species. C. G. Nast, S. K. Majumder.

S-30 The Flora of New Hampshire. A. R. Hodgdon.

S-46 Plant Disease Investigations. A. E. Rich.

Dairy Husbandry

H-65 The Influence of Herd Management Practices on Milk Production, Efficiency of Reproduction, and Herd Replacement Maintenance. K. S. Morrow.

H-67 The Relation of Seminal Fluid Fructose Levels to Factors Affecting Breeding Efficiency. C. H. Boynton.

H-75 Maximum Use of Roughage in Feeding Dairy Cattle. H. A. Keener, R. B. Eckberg.

H-76 The Effect of the Maximum Use of Roughage upon the Reproductive
NE-1 Efficiency of Dairy Cattle. H. A. Keener, A. C. Paul.

H-85 Package Milk Vending Machines as a Means of Increasing Fluid Milk Sales. H. C. Moore.

H-102 The Nutritive Evaluation of Forages for Dairy Cattle. N. F. Colovos,
NE-24 H. A. Keener, A. C. Paul, A. E. Terri, H. A. Davis, Dorothy Josselyn, V. F. Staab, R. L. Donahue.

S-60 The Use of Citrus Pulp to Reduce Cost of Concentrates in Feeding Dairy Cattle. H. A. Keener.

Entomology

H-43 Factors Affecting the Action of Acaricides. R. L. Blickle, W. J. Morse.

H-58 Testing New Organic Insecticides Under New Hampshire Conditions. J. G. Conklin, R. L. Blickle, W. J. Morse.

S-34 Insect Record. J. G. Conklin, W. J. Morse.

S-35 Control of Apple Maggot and Certain Other Economic Insects. J. G. Conklin.

S-36 Studies on the Ecology of European Spruce Saw-Fly. J. G. Conklin.

Forestry

H-61 Soil Yield Relationships of White Pine in Southern New Hampshire. Bertram Husch.

H-70 The Relationship of the Growth of White Pine in New Hampshire to Selected Environmental Characteristics. Bertram Husch.

H-82 Marketing Forest Products in New Hampshire. L. C. Swain, O. P.
NEM-6 Wallace.

H-89 The Utilization of Products from Chemically Treated Trees. L. C. Swain.

H-104 Site Preparation for Reproduction of Eastern White Pine. H. W. Hocker.

S-1 Reproduction Studies. H. W. Hocker, C. L. Stevens.

S-51 Relation of Available Labor to Woodlot Income on New Hampshire Dairy Farms. O. P. Wallace.

Home Economics

H-84 The Effect of Varying Intake Levels of Phosphorus on Blood Sugar
NE-16 and on Blood and Urinary Thiamine. A. M. Light, S. R. Shimer, Warren Averill, Beth Byers.

H-97 Color Changes in White Dacron Blouses. J. R. Ericson.

S-64 The Evaluation of New Varieties and Strains of Fruits and Vegetables and their Suitability for Processing. A. M. Light, Beth Byers.

Horticulture

H-37 Variety Tests of Fruits and Vegetables. A. F. Yeager, A. M. Light, L. P. Latimer, Russell Eggert, E. M. Meader, B. A. Barmby.

H-38 Improvement of Ornamental Plants. E. B. Risley.

H-39 Cultural Studies with Horticultural Crops. Russell Eggert, L. P. Latimer, E. M. Meader, B. A. Barmby.

H-40 Temperature Relations in Horticultural Plants Under New Hampshire Conditions. Russell Eggert, L. P. Latimer.

H-41 Nutritional Studies with Horticultural Plants. L. P. Latimer, Russell Eggert, G. P. Percival, Dorothy Josselyn.

H-54 Breeding Better Vegetables for New Hampshire. E. M. Meader, A. F. Yeager, Shi-an-Yu, Warren Averill.

H-56 The Development, Improvement, and Maintenance of Blueberry Fields. W. W. Smith.

H-64 The Use of Rootstocks and Interstocks as a Means of Securing Smaller, Hardier, and More Productive Apple Trees. W. W. Smith, B. A. Barmby.

H-74 Breeding Improved Fruits for New Hampshire. A. F. Yeager, E. M. Meader, Shi-an-Yu.

H-87 The Testing and Utilization of New Plant Materials in New Hamp-
NE-9 shire. A. F. Yeager.

S-38 Nut Improvement. A. F. Yeager.

Poultry Husbandry

H-52 The Inheritance of Feed Utilization Efficiency in Poultry. W. M. Collins, G. E. Wood.

H-53 Breeding for Meat-Type in Chickens. W. M. Collins, W. C. Skoglund.

H-55 Efficiency of Feed Utilization in Poultry Production. R. C. Ringrose, W. O. Merrill, R. M. Vondell.

H-60 Problems Involved in the Vaccination of Infectious Bronchitis. W. R. Dunlop, R. G. Strout.

H-73 A Study of Methods in the Development and Management of Pastures for Growing Pullets. R. C. Ringrose.

H-78 The Isolation and Control of Chronic Respiratory Disease in Chickens
NE-5 and the Relationship to the Satisfactory Immunization with Newcastle Disease and Infectious Bronchitis Vaccines. W. R. Dunlop. M. B. Lonsdale, R. G. Strout.

H-81 Factors Influencing the Market Quality of Eggs on New Hampshire Farms. W. C. Skoglund, Theodore Tzianabos.

H-88 Influence of Light and Humidity Upon the Physical Condition of
NE-8 Broilers. W. C. Skoglund.

H-92 Recurrent Selection vs. Closed Flock Selection for Improving Broiler
NE-6 Qualities. W. M. Collins.

S-55 Factors Influencing Sexual Maturity of Pullets. R. C. Ringrose.

S-56 The Effect of Low Level Chermotherapeutic Drugs in the Control of Coccidiosis in Growing Birds and Their Subsequent Performance in the Laying House. W. R. Dunlop.

S-62 A Study of the Complication of Pleuropneumonialike Organisms when Newcastle Disease and Infectious Bronchitis Vaccinations (Dust) Are Carried Out. W. R. Dunlop.

State Services

Inspection of Fertilizers and Feedingstuffs

The laboratory analyzes the official samples of fertilizers and feedingstuffs collected by the inspectors for the State Department of Agriculture. This is in accordance with state laws regulating the sale of fertilizers and feedingstuffs.

During the year ending June 30, 1956, 174 official samples of commercial fertilizers and fertilizer material were submitted for analysis. Of these 108 were complete fertilizers, 17 were superphosphate, 18 contained phosphoric acid and potash, and the rest were miscellaneous materials. Of the total number, 106 equalled or exceeded all guarantees. The penalty clause of the new law was invoked for the first time and adjustments were made by the manufacturer on a total of 18 cases. In general the manufacturers continue to supply good products to help increase the productivity of our farms. Detailed results of the analysis of these samples are published in Bulletin 432 of this Station.

The Control Supervisor submitted 702 official samples of feedingstuffs for analysis during the fiscal year. Of these 55 were cat and dog foods and 647 were livestock and poultry feeds. The deficiencies were in general small and indicate good milling practice by the manufacturers. The use of "bulk delivery" for feed is increasing and 43 samples were drawn from such lots. A beginning was made in the analysis for drug content of feeds labeled as supplying drugs. Lack of sufficient help prevents a complete analysis of such materials. Samples deficient in protein amounted to 7.8 percent of the total

number; deficient in fat, 3.5 percent and 4.0 percent contained an excess of crude fiber. Detailed results of the analysis are published in Bulletin 428 of this Station.

The accuracy and effectiveness of methods used in the laboratory are checked regularly. A series of 15 samples supplied by the American Oil Chemists Society and another of 6 samples supplied by the Association of Feed Control Officials were analyzed. More than 100 laboratories participate in this program and it provides a measure of the accuracy of our analytical work. The laboratory continues its collaborative work with the Association of Official Agricultural Chemists in the development and improvement of analytical methods.

A total of 75 samples of miscellaneous materials, hay, silages, feeds, and fertilizer materials were examined for residents of the state. Many of these required analytical work. While it is our policy to render such help to residents of the state, the amount of analytical work must in many cases be limited. Many inquiries can be answered by correspondence alone when the person seeking information supplies us with complete information concerning his problem.

Seed Inspection

The regular seed inspection work for the State Department of Agriculture was conducted as usual. During the year, 1,773 samples were handled in the laboratory. Of this number 643 were collected by the seed inspectors and are reported in Station Bulletin 434; 1,130 samples were sent in by seed dealers in compliance with the clause in our seed law which requires that all vegetable and agricultural seed must have been tested for germination within nine months of being offered for sale and therefore, much of this testing was seed carried over from the previous season; a few of these samples were sent in by farmers who had grown beans, corn or squash and wished to sell the seeds from these sources.

Our laboratory took part in the referee testing of samples sent out to all official seed testing laboratories in United States and Canada.

Bessie G. Sanborn

Soil Testing

During the last fiscal year, residents of the state submitted 3,159 soil samples for analysis of pH values and available nutrients. This work entailed 22,113 determinations. About 200 soil samples from greenhouses were tested for soluble salts. Six peat and muck samples submitted for identification were analyzed for moisture content, organic matter content, and for pH value and suggestions were made as to their commercial value.

G. P. Percival

Diagnostic Service Performed at the Poultry Laboratory

From July 1, 1955, to June 30, 1956, a total of 7,289 specimens of all kinds were submitted to the Poultry Laboratory for diagnosis. These represented 3,043 cases.

A total of 6,227 chicken specimens, 134 turkeys, and 26 miscellaneous birds were examined. There were 44 cases consisting of 108 specimens

from various animals also handled by the laboratory personnel. There were 300 cases (794 samples) of blood submitted for immunity tests.

A. C. Corbett, Richard Strout, W. R. Dunlop, F. E. Allen

Pullorum Testing

Testing of poultry for pullorum disease is done at the Poultry Laboratory. During the fiscal year, 1,246,701 birds were tested by means of the tube agglutination test. In addition, 48,496 retests were made, for a total of 1,295,197 samples tested for the year.

Of 382 flocks tested, none were found to harbor infection.

A. C. Corbett, F. E. Allen, W. R. Dunlop

Poultry Vaccines

The Poultry Laboratory has continued to manufacture the field strain of infectious bronchitis virus, and after testing for purity and potency it is sold to poultrymen of the state for inoculation of their susceptible birds. During the fiscal year, 292 lots of this virus were supplied to New Hampshire poultrymen.

We have also continued the manufacture of the experimental Newcastle-bronchitis spray vaccine developed at this Station. During the fiscal year, 607,300 doses were furnished New Hampshire poultrymen from July 1 until the termination date of the project on December 31, 1956.

A. C. Corbett, W. R. Dunlop, Richard Strout

Dairy Bacteriological Testing

During the year 406 milk test bottles and 34 pipettes were calibrated.

Other services covered include the supplying of the Babcock glassware and acid to the D.H.I.A. testers and the testing of milk samples for bacteria, fat, and solids.

H. C. Moore

New Hampshire Agricultural Experiment Station Staff

June 30,1956

Administration

HAROLD C. GRINNELL, PH.D., Director
MATHIAS C. RICHARDS, PH.D., Associate Director
RUSSELL C. SMITH, B.A., Purchasing Assistant
NORMAN W. MYERS, B.A., Treasurer
W. KENT MARTLING, L.L.B., Assistant Treasurer
L. FRANKLIN HEALD, B.A., Editor
HENRY W. CORROW, JR., B.S., Associate Editor for Agriculture and Home Economics
THELMA BRACKETT, A.B., Librarian
CYNTHIA L. DUNN, A.B., Librarian, Plant and Animal Sciences Library
MAISIE C. BURPEE, Secretary
THERESA R. BATCHELDER, Mail Clerk

Agricultural and Biological Chemistry

ARTHUR E. TEERI, PH.D., Chemist
THOMAS G. PHILLIPS, PH.D., Chemist
STANLEY R. SHIMER, M.S., Associate Chemist
GORDON P. PERCIVAL, M.S., Associate Chemist
HENRY A. DAVIS, M.S., Associate Chemist
WARREN AVERILL, PH.D., Assistant Chemist
MARGARET E. LOUGHLIN, M.S., Assistant Chemist
VESTA F. STAAB, B.S., Research Assistant
DOROTHY JOSSELYN, Senior Laboratory Technician

Agricultural Economics

WILLIAM F. HENRY, M.S., Agricultural Economist
WINFRED K. BURKETT, PH.D., Associate Economist
JAMES R. BOWRING, PH.D., Associate Economist
OWEN DURGIN, M.A., Sociologist
LAWRENCE A. DOUGHERTY, B.S., Assistant Economist
WILLIAM H. DREW, M.S., Associate Economist
GEORGE E. FRICK, M.S., Economist, A.R.S.,U.S.D.A.
GEORGE B. ROGERS, M.S. Economist, A.M.S.,U.S.D.A.
EDWIN T. BARDWELL, B.S., Economist, A.M.S.,U.S.D.A.

Agricultural Engineering

ROBERT S. PALMER, B.S.A.E., Assistant Agricultural Engineer
GORDON L. BYERS, M.S., Associate Agricultural Engineer

Agronomy

ROY L. DONAHUE, PH.D., Agronomist
FORD S. PRINCE, B.S., Agronomist
LEROY J. HIGGINS, B.S., Associate Agronomist
ALLAN B. PRINCE, PH.D., Associate Soil Chemist
PAUL T. BLOOD, M.S., Associate Agronomist
GERALD M. DUNN, PH.D., Associate Plant Breeder
SCOTT A. MILLER, JR., PH.D., Assistant Soil Physicist
BESSIE G. SANBORN, Seed Analyst
KENNETH H. MACKAY, B.S., Graduate Research Assistant
WALTER LYFORD, M.S., S.C.S. Cooperator

Bacteriology

Lawrence W. Slanetz, ph.d., Bacteriologist
William A. Ayers, ph.d., Assistant Bacteriologist
Fred E. Allen, d.v.m., Veterinarian
Alberta F. Menter, Laboratory Assistant
Dona C. Hooper, b.s., Graduate Research Assistant
Joseph Marelli, Departmental Technician

Botany

Albion R. Hodgdon, ph.d., Plant Taxonomist
Stuart Dunn, ph.d., Plant Physiologist
Charlotte G. Nast, ph.d., Associate Cytologist
Avery Rich, ph.d., Plant Pathologist
R. A. Kilpatrick, ph.d., a.r.s. Cooperator
Joseph G. Barrat, Jr., m.s. Graduate Research Assistant
Robert F. Becker, b.s., Graduate Research Assistant
Subhash C. Datta, m.s., Graduate Research Assistant
Charlotte A. Fuller, b.s., Graduate Research Assistant
Sanat Majumder, m.s., Graduate Research Assistant
Arthur D. Partridge, b.s., Graduate Research Assistant

Dairy Husbandry

Kenneth S. Morrow, m.s., Dairy Husbandman
Harry A. Keener, ph.d., Dairy Husbandman
Herbert C. Moore, m.s., Associate Dairy Husbandman
Nicholas F. Colovos, m.s., Associate Animal Nutritionist
C. Hilton Boynton, m.s., Associate Dairy Husbandman
Ann C. Paul, b.s., Research Assistant
Robert B. Eckberg, b.s., Graduate Research Assistant

Entomology

James G. Conklin, ph.d., Entomologist
Robert L. Blickle, ph.d., Associate Entomologist
Wallace J. Morse, b.s., Research Assistant

Forestry

Clark L. Stevens, ph.d., Forester
Lewis C. Swain, m.f., Associate Forester
Bertram Husch, ph.d., Associate Forester
Oliver Wallace, ph.d., Assistant Forester
Harold W. Hocker, Jr., d.for., Assistant Forester

Home Economics

Anna M. Light, ph.d., Home Economist
R. June Ericson, m.a., Associate Home Economist
Beth A. Byers, b.s., Graduate Research Assistant

Horticulture

Albert F. Yeager, ph.d., Horticulturist
L. Phelps Latimer, ph.d., Associate Horticulturist
Elwyn M. Meader, m.s., Associate Horticulturist
William W. Smith, ph.d., Associate Horticulturist
Russell Eggert, m.s., Associate Horticulturist
Edward B. Risley, m.s., Assistant Horticulturist
Radcliffe Pike, m.s., Collaborator
Bruce A. Barmby, b.s., Graduate Research Assistant
Shih-an-Yu, b.s., Graduate Research Assistant

Winthrop C. Skoglund, m.s., Poultry Husbandman
Richard C. Ringrose, ph.d., Poultry Nutritionist
Fred E. Allen, d.v.m., Veterinarian
Alan C. Corbett, d.v.m., Pathologist
William R. Dunlop, d.v.m., Research Pathologist
Walter M. Collins, m.s., Poultry Geneticist
Richard G. Strout, m.s., Assistant Poultry Husbandman
Wallis S. Rand, Laboratory Assistant
Theodore Tzianabos, b.a., Senior Laboratory Technician and Research Assistant
Emily Donovan, Junior Laboratory Technician
Harriet N. Fogg, Junior Loboratory Technician
Bertha Mann, Junior Laboratory Technician
Kathryn Moore, Junior Laboratory Technician
Rose Thomas, Junior Laboratory Technician
Edna Woodward, Junior Laboratory Technician
Matthew B. Lonsdale, b.s., Graduate Research Assistant
William O. Merrill, b.s., Graduate Research Assistant
Richard Vondell, b.s., Graduate Research Assistant
George E. Wood, b.s., Graduate Research Assistant
Carl Weston, b.s., Graduate Research Assistant

Changes in Personnel

Additions to Staff

Barrat, Joseph G., Jr., Graduate Research Assistant in Botany (September 1, 1955-)
Becker, Fay R., Laboratory Technician in Agricultural and Biological Chemistry (July 1, 1955-April 30, 1956)
Byers, Gordon L., Associate Agricultural Engineer (March 5, 1956-)
Drew, William H., Associate Economist (February 1, 1956-)
Ericson, R. June, Associate Home Economist (September 1, 1955-)
Fuller, Charlotte, Graduate Research Assistant in Botany July 1, 1955-June 30, 1956)
Hocker, Harold W., Jr., Assistant Forester (September 1, 1955-)
Kumin, Richard T., Graduate Research Assistant in Bacteriology (September 1, 1955-May 31, 1956)
Mann, Bertha, Junior Laboratory Technician in Poultry Husbandry (July 1, 1955-)
Mann, Wayne A., Graduate Research Assistant in Agricultural Economics (June 18, 1955-September 15, 1955)
Martling, W. Kent, Assistant Treasurer (September 15, 1955-)
Menter, Alberta F., Laboratory Assistant in Bacteriology (July 18, 1955-)
Merrill, William O., Graduate Research Assistant in Poultry Husbandry (September 15, 1955-June 30, 1956)
Paul, Ann C., Research Assistant in Dairy Husbandry (September 1, 1955-)
Purington, Malcom C., Graduate Research Assistant in Agricultural Economics (September 16, 1955-April 30, 1956)
Strang, Robert R., Research Assistant in Animal Husbandry (July 1, 1955-May 9, 1956)
Thomas, Rose, Junior Laboratory Technician in Poultry Husbandry (July 1, 1955-)
Tzianabos, Theodore, Senior Laboratory Technician and Research Assistant in Poultry Husbandry (July 7, 1955-)
Weston, Carl R., Graduate Research Assistant in Poultry Husbandry (February 1, 1956-)

Losses from Staff

Barmby, Bruce, Graduate Research Assistant in Horticulture (July 1, 1954-June 30, 1956)
Becker, Fay, Laboratory Technician in Agricultural and Biological Chemistry (July 1, 1955-April 30, 1956)

Becker, Robert F., Graduate Research Assistant in Botany, (July 1, 1954-June 30, 1956)

Byers, Beth A., Graduate Research Assistant in Home Economics (July 1, 1954-June 30, 1956)

Dunn, Cynthia L., Librarian, Plant and Animal Sciences Library (June 1, 1954-June 30, 1956)

Eckberg, Robert B., Graduate Research Assistant in Dairy Husbandry (July 1, 1954-June 30, 1956)

Fuller, Charlotte, Graduate Research Assistant in Botany (July 1, 1955-June 30, 1956)

Hooper, Dona, Graduate Research Assistant in Bacteriology (February 1, 1955-June 30, 1956)

Kumin, Richard T., Graduate Research Assistant in Bacteriology (September 1, 1955-May 31, 1956)

Lonsdale, Matthew B., Graduate Research Assistant in Poultry Husbandry (July 1, 1954-June 30, 1956)

MacKay, Kenneth H., Graduate Research Assistant in Agronomy (July 1, 1954-June 30, 1956)

Mann, Wayne A., Graduate Research Assistant in Agricultural Economics (July 18, 1955-September 15, 1955)

Merrill, William O., Graduate Research Assistant in Poultry Husbandry (September 15, 1955-June 30, 1956)

Purington, Malcolm C., Graduate Research Assistant in Agricultural Economics (September 16, 1955-April 30, 1956)

Strang, Robert R., Research Assistant in Animal Husbandry (July 1, 1955-May 9, 1956)

Vondell, Richard, Graduate Research Assistant in Poultry Husbandry (September 1, 1954-June 30, 1956)

Wood, George E., Graduate Research Assistant in Poultry Husbandry (July 1, 1954-June 30, 1956)

Publications

Experiment Station Bulletins

421 *Inspection of Commercial Feedingstuffs.* H. A. Davis and V. F. Staab.

422 *Results of Seed Tests for 1955.* Bessie G. Sanborn.

423 *Inspection of Commercial Fertilizers.* H. A. Davis and V. F. Staab.

424 *Soils and Their Crop Adaptations in New Hampshire.* L. E. Garland, H. R. Adams, and R. L. Donahue.

Station Technical Bulletin

94 *A Simple Method for Grading Hardwood Logs.* O. P. Wallace.

Scientific Contributions

171 Husch, Bertram. "Results of an Investigation of the Variable Plot Method of Cruising." *Jour. For.* 53:570-574,1955.

174 Teeri, A. E., E. Pomerantz, N. F. Colovos, and H. A. Keener. "Vitamin Excretion by Deer." *Jour. Mam.* 36:553-557,1955.

176 Blickle, R. L., "Observations on the Habits of Tabanidae." *Ohio Jour. Sci.* 55(5): 308-310,1955.

177 Yeager, A. F., and E. M. Meader. "The Sunapee Peach." *Fruit Varieties and Hort. Digest* 9:58,1954

178 Blickle, R. L. and W. J. Morse. "New and Little Known Polycentropus (Trichoptera)." *Bulletin of the Brooklyn Ent. Soc.* 50:95-98,1955.

181 Sullivan, J. T., T. G. Phillips, M. E. Loughlin, and M. E. Sprague. "Chemical Composition of Some Forage Grasses. II. Successive Cuttings During the Growing Season." *Agron. Jour.* 48:11-14,1956.

184 Blickle, R. L., "Notes on the Life History of Cephenemyia phobifer Clark (Diptera)." *Ent. News* 67:13-14,1956.

Progress Reports

Vol. 2, No. 1:1-12
Vol. 2, No. 2:1-16
Vol. 2, No. 3:1-16

Research Mimeographs

Botany

1 Dunn, Stuart and S. C. Datta. "Light Effects on Phytotoxicity With Respect to Herbicides."
2 Hodgdon, A. R. "Experiments on Quack-Grass (Agropyron Repens) with Sodium Trichloracetate."
3 Rich, A. E. and James De. Bilbruck. "The Effect of Various Fungicides Applied During Bloom on Apple Pollination and Fruit Set."

Forestry

3 Gibbs, Carter and Bertram Husch. "Forest and Land Use Trends from Aerial Photographs 1943-1953, Town of Madbury, N. H."
4 Wallace, O. P. "Some Economics of Fire Control in New Hampshire."
5 Garland, L. E., R. W. Wilson Jr., et al. "Preliminary Forest Site Productivity Rating Guide."

Poultry

1 Cherms, F. L., Jr., and G. E. Wood. "Green Shank and Green Abdomen Problem in Broilers."

Expenditures for the Fiscal Year Ending June 30, 1956

	Hatch	9b3	Supplementing
Personal Services	$164,082.90	$21,730.69	$114,063.26
Travel	1,645.67	4,747.21	5,693.95
Transportation of Things	192.31	763.32	531.67
Communication Service	62.70	80.58	1,525.15
Rents and Utility Services		184.17	1,890.48
Printing and Reproduction	50.15	61.00	2,151.84
Other Contractual Services	241.12	131.69	209.41
Supplies and Materials	10,743.82	9,979.28	39,066.62
Equipment	9,922.53	6,462.06	7,811.88
Lands and Structures	7,446.00		
	$194,387.20	$44,140.00	$172,944.25

Income from Supplementary Expenditures	
State Money Offsetting Federal Funds	$104,387.20
State Money for Station	25,612.80
Research Sales	14,207.68
Other Income (Mostly Private Grants)	28,736.57
	$172,944.25

630.72
N532
no.426-450

DATE DUE

NOV 4 '64	
MAY 19 '65	
Sept 29	
OCT 28 '68	
	F32a